Chemical Sciences and Engineering

Aspen LIMS

Customization

What's New?

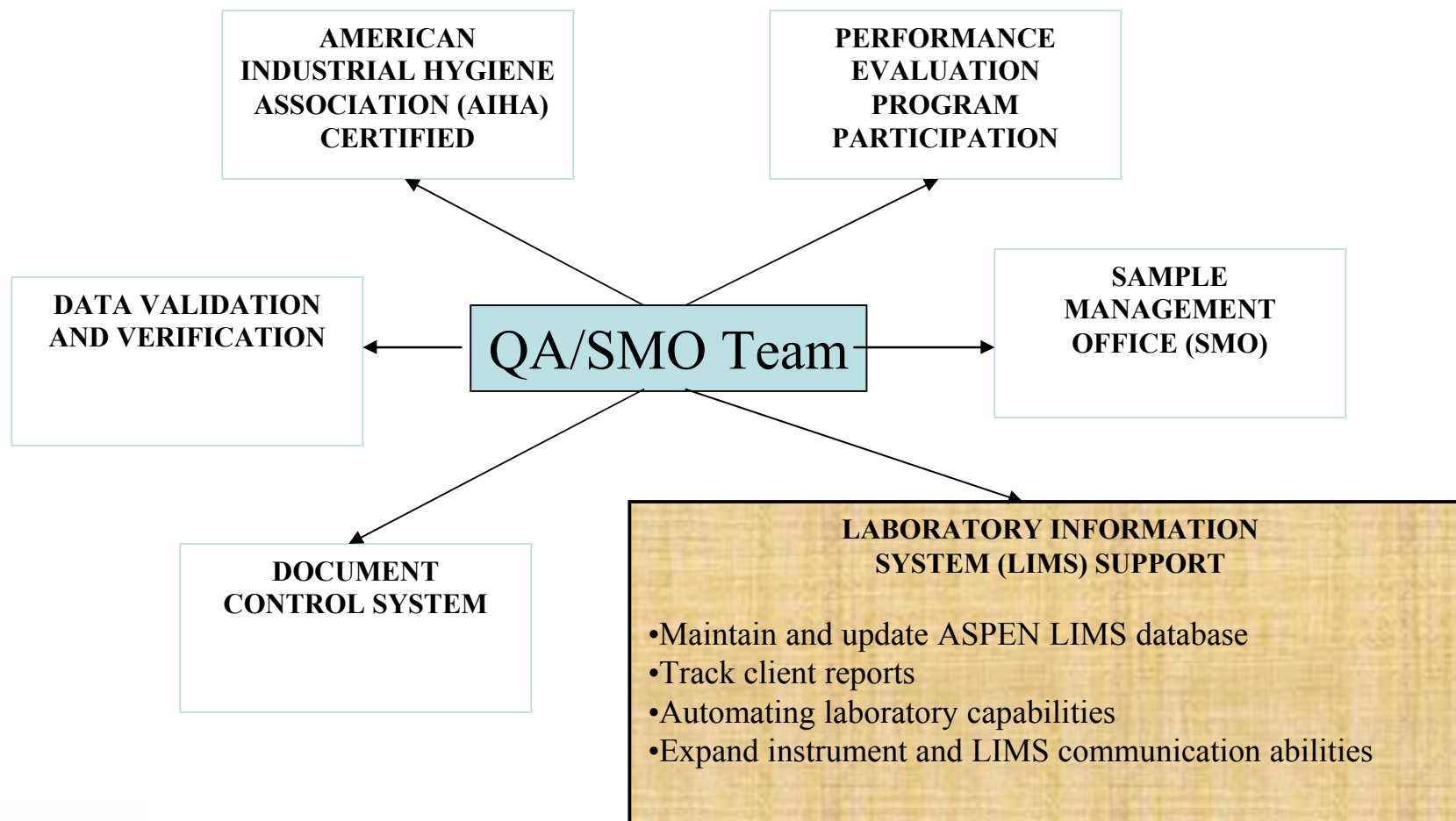*Maura Wilhelm*

Aspen LIMS Database Administrator

Los Alamos
NATIONAL LABORATORY
— EST.1943 —
The World's Greatest Science Protecting America

CHEMISTRY

NNSA

Chemistry Division
Chemical Sciences and Engineering Group (C-CSE)
Quality Assurance/Sample Management Team

AMERICAN INDUSTRIAL HYGIENE ASSOCIATION (AIHA) CERTIFIED

PERFORMANCE EVALUATION PROGRAM PARTICIPATION

DATA VALIDATION AND VERIFICATION

QA/SMO Team

SAMPLE MANAGEMENT OFFICE (SMO)

DOCUMENT CONTROL SYSTEM

LABORATORY INFORMATION SYSTEM (LIMS) SUPPORT

- Maintain and update ASPEN LIMS database
- Track client reports
- Automating laboratory capabilities
- Expand instrument and LIMS communication abilities

Los Alamos
NATIONAL LABORATORY
EST. 1943
The World's Greatest Science Protecting America

CHEMISTRY

NNSA

Samples Analyzed and Reported in Aspen by Fiscal Year
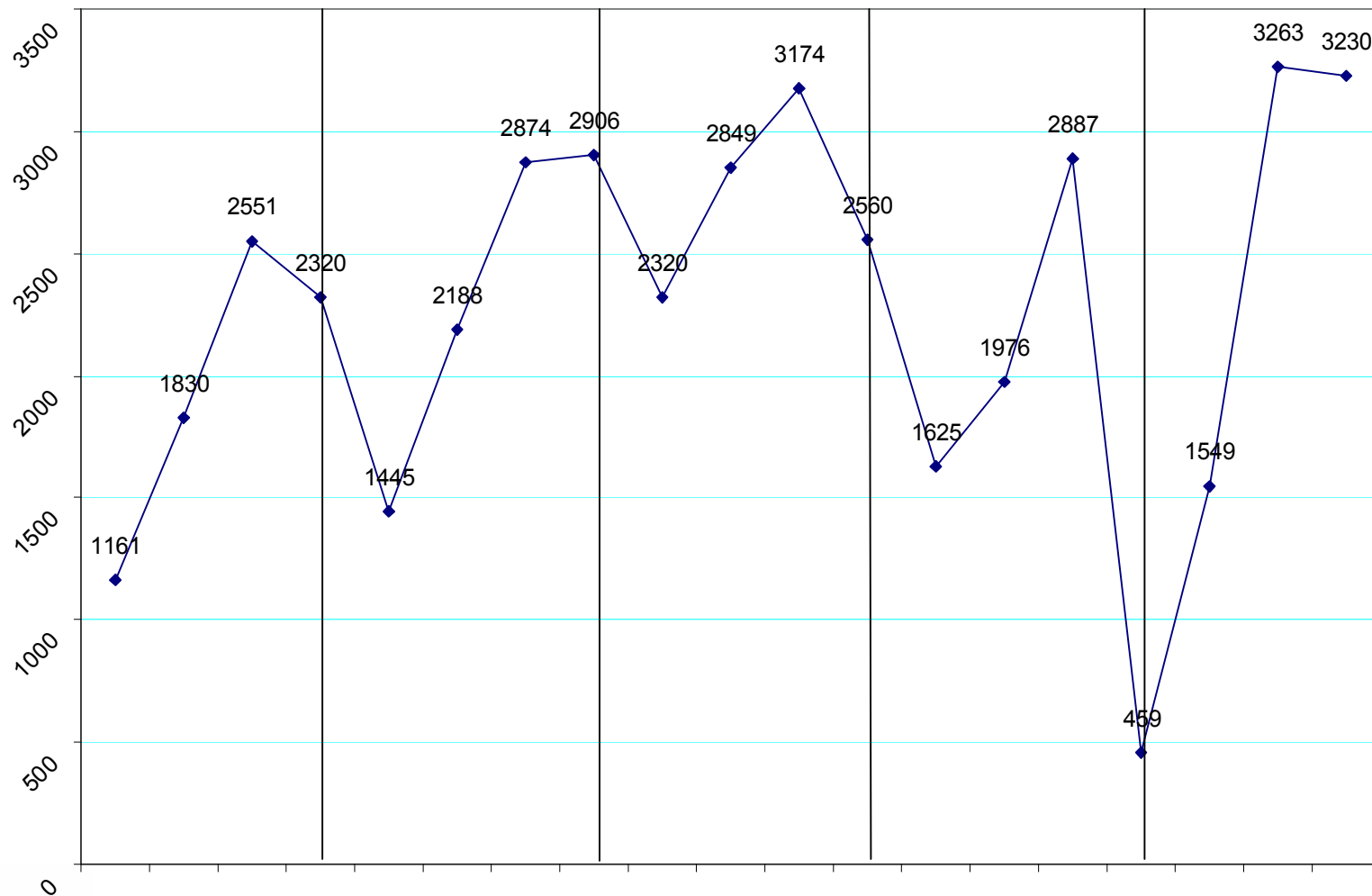
Sample Processing through LIMS
Sample Login

Samples collected in field by
Health, Safety, and Radiation Protection
Industrial Hygienists

Samples Received by
Sample Management Office
personnel

Samples logged into Laboratory Information
Management System (LIMS)

Sample Delivery Package number is assigned in Aspen

Aspen Enterprise
Laboratory Information Management System
Los Alamos National Lab

Active Samples
- Login/Edit Samples
- Enter Prep/Sample Information
- Import Data
- Review QC
- Review Status
- Routine Reports
- Print Reports

Archived Samples
- Select Archives
- Review Samples
- Routine Reports
- Print Reports

Utilities
- Quotations
- Utilities Menu
- User Ext.
- Exit LIMS

Version 4.5 — 30007
Licensed For: 15 Users
Current User: 100603

Login Samples   10/31/02   14:27   100603

Lab Sample #: 02103105-001
Ref. ID: IH Be, Pb, & U
Sample Type: Filters, Swipe
Customer Sample ID: LIMS V6 test A
ClientID: MTW   Maura T. Wilhelm
Program Code: xxxxxxxxxxx

From Schedule: ☐
Priority: ☐   Use Business Days: ☑
Screening Data:
Note: Filter Swipes for Be, Pb, & U Analysis
ID/Work Card #:

Reference Library
Test Group Library
→Add Test Group→
Preview Tests in Group

Test Group(s) Assigned to Sample:

	TestGroupID:	TestGroup Name:	Lab Section:	SortNo:	Assoc:
▶	SP147	Metals on Filters	IH-HCPES	1	A

Record: |◀ ◀ 1 ▶ ▶| ▶* of 1

Test Group Login
- ←Delete Group
- Edit Group Order
- Modify Tests
- Container Info

New Sample   Replicate Sample   Delete Sample   Subcontractors   Print SDG Documents
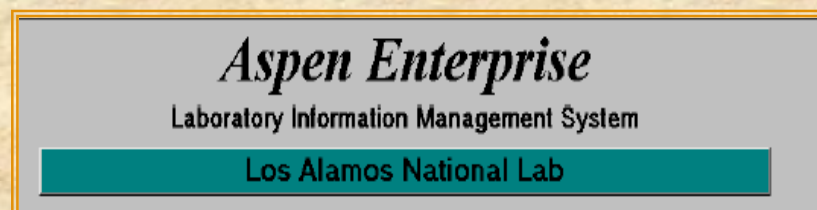
Sample Processing through LIMS
Prep Batch Creation

Digestion Analyst accepts custody of samples from SMO personnel

Analyst completes digestion process in digestion lab

Analyst creates prep batch in Aspen

Aspen Enterprise
Laboratory Information Management System
Los Alamos National Lab

Active Samples

- Login/Edit Samples
- Enter Prep/Sample Information
- Import Data
- Review QC
- Review Status
- Routine Reports
- Print Reports

Enter Existing Prep Data

Prep#	62		Prep Date:	9/11/2003		Prep By:	086458

	QC	Lab#	TestGroup ID	Container ID:	Prep Method:	SampleID	Digestion Dilution	Prep Date	Selec Dele
...		03091103-001	SP147	03091103-001-01A	SP147	091003SJS1	10	9/11/2003	
...		03091103-002	SP147	03091103-002-01A	SP147	091003SJS2	10	9/11/2003	
...		03091103-003	SP147	03091103-003-01A	SP147	091003SJS3	10	9/11/2003	
...		03091103-004	SP147	03091103-004-01A	SP147	091003SJS4	10	9/11/2003	
...		03091103-005	SP147	03091103-005-01A	SP147	091003SJS5	10	9/11/2003	
...		03091103-006	SP147	03091103-006-01A	SP147	091003SJS6	10	9/11/2003	
...		03091103-007	SP147	03091103-007-01A	SP147	091003SJS7	10	9/11/2003	
...		03091103-008	SP147	03091103-008-01A	SP147	091003SJS8	10	9/11/2003	
...		03091103-009	SP147	03091103-009-01A	SP147	091003SJS9	10	9/11/2003	
...		03091103-010	SP147	03091103-010-01A	SP147	091003SJS10	10	9/11/2003	
...		03091103-011	SP147	03091103-011-01A	SP147	091003SJS11	10	9/11/2003	
...		03091103-012	SP147	03091103-012-01A	SP147	091003SJS12	10	9/11/2003	
...		03091103-013	SP147	03091103-013-01A	SP147	091003SJS13	10	9/11/2003	
...		03091103-014	SP147	03091103-014-01A	SP147	091003SJS14	10	9/11/2003	
...		03091103-015	SP147	03091103-015-01A	SP147	091003SJS15	10	9/11/2003	
...		03091103-016	SP147	03091103-016-01A	SP147	091003SJS16	10	9/11/2003	
...		03091103-017	SP147	03091103-017-01A	SP147	091003SJS17	10	9/11/2003	
...		03091103-018	SP147	03091103-018-01A	SP147	091003SJS18	10	9/11/2003	
...		03091103-019	SP147	03091103-019-01A	SP147	091003SJS19	10	9/11/2003	
...		03091103-020	SP147	03091103-020-01A	SP147	091003SJS20	10	9/11/2003	

NEW!

Del... | Edit Prep Data | Print Digestion Log | Print Auto Sampler Report | Back

DIGESTION LOGBOOK INFORMATION

BatchID	091103 IH - 62	Prep#:	62
PrepDate:	9/11/2003	Method:	SP147
Analyst:	086458		

Pipette ID: W623816   Reference Notebook: CST9370

Digestion Acids   Digestion Dilution

H2SO4 Lot Number	3101010	PB Dilution:	
HCl Lot Number:	4102110	BM Dilution:	
H2O2 Lot Number	031737	LCS Dilution:	
HNO3 Lot Number	1103010	SM Dilution:	
		SMD Dilution	

QC Information

BM Lot Number: D1409048

LCS Name 00.39876-C

Spike Solution ID: SMAUG2003

Note: All the fields with drop down lists are manually editable fields with the exception of "LCS Name" and "Spike Solution ID." Please inform the LIMS Administrator if these fields need to be updated.

Comments: None

Done

Sample Processing through LIMS
Batch setup on instrument

Analyst creates Digestion Logbook Report and Autosampler Report → **Analyst loads Autosampler Report into PE WinLab32 Sample Information file** →

DIGESTION LOGBOOK

Batch ID: 093003 IH - 97   Prep#: 97   Spike Solution ID: SMAUG2003

Prep Date: 9/30/2003   Method: SP147   Spike Received Date: 7/1/2003

Analyst **Straw (101091)**   Pipette ID/Reference Notebook **W623816 / CST9370**   Spike Expiration: 7/1/2004

Digestion Acids: H_2SO_4 Lot Number: **3101010** H_2O_2 Lot Number: **31737**   Spike Reference Notebook and Page **CST9557-57**

HCl Lot Number: **4102110** HNO_3 Lot Number: **1103010**   Spike Solution Lot # **203454A**

VESSEL NUMBER	COMMENTS	SDG	SAMPLE INFO	DIGESTION VOLUME	SAMPLE MATRIX	ANALYTE	DUE DATE
1			PB 093003 IH - 97	10			
2	Lot Number * D1409048		FILTER BLANK BM	10			
3	Lot Number 222820		00.39876-D (TA-59) LCS	10			
4	100uL		FILTER SPIKE SM	10			
5	100uL		FILTER SPIKE SMD	10			
6		03092902-001		10	Filters, Swipe	Be, Pb, U	10/2/2003
7		03092902-002		10	Filters, Swipe	Be, Pb, U	10/2/2003
8		03092902-003		10	Filters, Swipe	Be, Pb, U	10/2/2003
9		03092902-004		10	Filters, Swipe	Be, Pb, U	10/2/2003
10		03092902-005		10	Filters, Swipe	Be, Pb, U	10/2/2003
11		03092902-006		10	Filters, Swipe	Be, Pb, U	10/2/2003
12		03092902-007		10	Filters, Swipe	Be, Pb, U	10/2/2003
13		03092902-008		10	Filters, Swipe	Be, Pb, U	10/2/2003
14		03092902-009		10	Filters, Swipe	Be, Pb, U	10/2/2003
15		03092902-010		10	Filters, Swipe	Be, Pb, U	10/2/2003
16		03092902-011		10.5	Filters, Swipe	Be, Pb, U	10/2/2003
17		03092902-012		10	Filters, Swipe	Be, Pb, U	10/2/2003
18		03092902-013		10	Filters, Swipe	Be, Pb, U	10/2/2003
19		03092902-014		10	Filters, Swipe	Be, Pb, U	10/2/2003
20		03092902-015		10	Filters, Swipe	Be, Pb, U	10/2/2003
21		03092902-016		10	Filters, Swipe	Be, Pb, U	10/2/2003
22		03092902-017		10	Filters, Swipe	Be, Pb, U	10/2/2003
23		03092902-018		10	Filters, Swipe	Be, Pb, U	10/2/2003
24		03092902-019		10	Filters, Swipe	Be, Pb, U	10/2/2003
25		03092902-020		10	Filters, Swipe	Be, Pb, U	10/2/2003

NEW!

* Filter Spike and Filter Spike Dup are the same lot number as the Filter Blank.

Sample Processing through LIMS
Sample Analysis and Import

Analyst processes batch on PE Instrument performing reanalysis as needed	→	Analyst downloads raw instrument data to LimsLink	→	LimsLink parses raw data for import into Aspen	→	Analyst imports text file from LimsLink to Aspen

Aspen sets up data for import into the worksheet by prompting the analyst to select QC templates

Analyst imports sample and QC results into new Worksheet in Aspen

Imported Data

LAB#	QC Code	Test Group ID	Test ID	Numeric Result	Alpha Result	Units	Anal Date	Anal By	MDL	Weight	Volume	Dilution	S
PB 020905 IH - 882	PB	Method Blank	Be	-5.298E-05			2/9/2005	201750			10	1	
InstrumentID:													
Media Blank	BM	Media Blank	Be	-7.8019E-05			2/9/2005	201750				1	
InstrumentID:													
00.39876-C003 LCS	LCS	LCS	Be	0.092224368			2/9/2005	201750			10		
InstrumentID:													
Media Spike	SM	Media Spike	Be	0.370431115			2/9/2005	201750			10	1	
InstrumentID:													
Media Spike Dup	SMD	Media Spike	Be	0.37502419			2/9/2005	201750			10	1	
InstrumentID:													
05020904-001		SP147	Be	0.000295181			2/9/2005	201750			10	1	
InstrumentID:													
05020904-002		SP147	Be	0.000493623			2/9/2005	201750			10	1	
InstrumentID:													
05020904-003		SP147	Be	-0.00018272			2/9/2005	201750			10	1	
InstrumentID:													
05020904-004		SP147	Be	-5.0191E-06			2/9/2005	201750			10	1	
InstrumentID:													
05020904-005		SP147	Be	-5.5487E-05			2/9/200				10	1		
InstrumentID:													
05020904-006		SP147	Be	0.00036779			2/9/200				10	1		
InstrumentID:													
05020904-007		SP147	Be	-0.00010138			2/9/200				1			

Add Record   Send To LIMS   Delete Import Record   Print   Close

Set QC Test Group ID

NEW!

LCS Test Group ID's

Select A Test Group ID

00.39876	Laboratory Control Sample for IH
00.39878	Laboratory Control Sample for IH
00.39890	Laboratory Control Sample for IH
00.39892	Laboratory Control Sample for IH
00.ResEnv	IH Filter - Be

Sample Processing through LIMS
Analysis Results Import to Worksheet and QC Flagging

Analyst imports results automatically via Aspen's Import Process into new Worksheet

Aspen calculates Reported Results for Samples based on raw data imported from instrument.

Aspen calculates Reported Results for QC and sets flags based on QC template parameters.

Enter TEST Results — Worksheet has QC Assigned.

QC Prefix: 03   99 - Inorganic 01 - Radchem
02 - Organic 03 - IH

WS#: WS005122   Lab Section: Industrial Hygiene

QC	Lab#	Customer Sample ID	Test Group ID	Test	Numeric Result	Alpha Result	Flag	Reported Result	Units	MDL	Volume	Dilution
	05072903-001	072605RBS01	SP147	Be	0.000224105		<	0.03	ug/filter	0.003	10	1
Comments:			CalcResult	0.0022410496	CalcMDL	0.03		Instrument ID				
	05072903-002	072605RBS02	SP147	Be	0.0002849466		<	0.03	ug/filter	0.003	10	1
Comments:			CalcResult	0.0028494665	CalcMDL	0.03		Instrument ID				
	05072903-003	072605RBS03	SP147	Be	0.0010384852		<	0.03	ug/filter	0.003	10	1
Comments:			CalcResult	0.0103848519	CalcMDL	0.03		Instrument ID				
	05072903-004	072605RBS04	SP147	Be	4.165826E-05		<	0.03	ug/filter	0.003	10	1
Comments:			CalcResult	0.0004165826	CalcMDL	0.03		Instrument ID				
	05072903-005	072605RBS05	SP147	Be	8.070057E-05		<	0.03	ug/filter	0.003	10	1
Comments:			CalcResult	0.0008070057	CalcMDL	0.03		Instrument ID				
	05072903-006	072605RBS06	SP147	Be	0.0001839729		<	0.03	ug/filter	0.003	10	1
Comments:			CalcResult	0.0018397290	CalcMDL	0.03		Instrument ID				
	05072903-007	072605RBS07	SP147	Be	8.209995E-05		<	0.03	ug/filter	0.003	10	1
Comments:			CalcResult	0.0008209995	CalcMDL	0.03		Instrument				
	05072903-008	072605RBS08	SP147	Be	0.0006256839		<	0.03					
Comments:			CalcResult	0.0062568389	CalcMDL	0.03		Instrument				
	05072903-009	072605RBS10	SP147	Be	0.0001534803		<	0.03					
Comments:			CalcResult	0.001534803	CalcMDL	0.03		Instrument				
	05072903-010	072605RBS11	SP147	Be	0.008690C			0.09					

Mark Status   Enter Description   Export   Data Trends   Tests for Re-Analysis   Pre Info   View QC

User Ext.   Print   Back

NEW!

All QC

QC Lab#	QC Code	QC Test Group ID	QC Test ID	QC Numeric Result	Result Flag	Reported Result	NT	QC True/Added:	QC Low Limit	QC High Limit	QC Mode	MDL
Media Blank	BM	00.36898	Be	0.0020359613	<	0.03		0	-0.03	0.09		0.0
		%R Flag			RPD Flag		LIMS#:	24135 Sigma :	0			
Media Spike	SM	SMJUN2005-5	Be	0.321806718		3.22		4	80	109	Relative	0.0
%R	80.45	%R Flag			RPD Flag		LIMS#:	24136 Sigma :	0	-11	10	Relative	0.0
Media Spike Dup	SMD	SMDJUN2005	Be	0.3254004564		3.25		4	80	109	Relative	0.0
%R	81.35	%R Flag	RPD	-1.10	RPD Flag		LIMS#:	24137 Sigma :	0	-11	10	Relative	0.0
PB 072605 IH - A	PB	00.39756	Be	-0.000462070				0	-0.03	0.09		0.0
		%R Flag			PD Flag		LIMS#.	24138 Sigma :	0			

Microsoft Access

QC Flags Set

OK

Sample Processing through LIMS
Preliminary Reporting in Aspen

Analyst compiles Data Package consisting of all documents and reports related to Sample	→	Data Package is sent to peer review	→	Analyst generates a Preliminary Report which is Emailed to Customer

*** Preliminary Worksheet Report ***
Wednesday, August 03, 2005
Worksheet #: WS004972, LB05060607, ID/Workcard #: 200501363

Customer Sample ID: 200501363 A   **C-CSE Lab#:** 05060607-001
LabSection: IH-ICPES

Test Name	Flag	Reported Result	PQL	Units	Analysis Date	Method
Aluminum	<	5.25	5.25	ug/filter	6/8/2005	SP147
Beryllium	<	0.03	0.03	ug/filter	6/8/2005	SP147
Iron		7.77	6.5	ug/filter	6/8/2005	SP147
Lead	<	1.20	1.2	ug/filter	6/8/2005	SP147

Customer Sample ID: 200501363 B   **C-CSE Lab#:** 05060607-002
LabSection: IH-ICPES

Test Name	Flag	Reported Result	PQL	Units	Analysis Date	Method
Aluminum	<	5.25	5.25	ug/filter	6/8/2005	SP147
Beryllium	<	0.03	0.03	ug/filter	6/8/2005	SP147
Iron		7.56	6.5	ug/filter	6/8/2005	SP147
Lead	<	1.20	1.2	ug/filter	6/8/2005	SP147

Customer Sample ID: 200501363 C   **C-CSE Lab#:** 05060607-003
LabSection: IH-ICPES

Test Name	Flag	Reported Result	PQL	Units	Analysis Date	Method
Aluminum	<	5.25	5.25	ug/filter	6/8/2005	SP147
Beryllium	<	0.03	0.03	ug/filter	6/8/2005	SP147
Iron		8.13	6.5	ug/filter	6/8/2005	SP147
Lead	<	1.20	1.2	ug/filter	6/8/2005	SP147

Customer Sample ID: 200501363 D   **C-CSE Lab#:** 05060607-004
LabSection: IH-ICPES

Test Name	Flag	Reported Result	PQL	Units	Analysis Date	Method
Aluminum	<	5.25	5.25	ug/filter	6/8/2005	SP147
Beryllium	<	0.03	0.03	ug/filter	6/8/2005	SP147
Iron	<	6.50	6.5	ug/filter	6/8/2005	SP147
Lead	<	1.20	1.2	ug/filter	6/8/2005	SP147

*** Preliminary Worksheet Report ***   *Page 1 of 7*

*** Preliminary Worksheet Report ***
Wednesday, August 03, 2005
Worksheet #: WS004972, LB05060607, ID/Workcard #: 200501363

Media Spike Dup

QC ID   SMDJUN2005

Test Name	Result Flag	Result	PQL	Units	Analysis Date	QC Value	%R / RPD	%R Flag	RPD Flag
Aluminum		7.68	5.25	ug/filter	6/8/2005	8	96.0 / -1.00		
Beryllium		3.78	0.03	ug/filter	6/8/2005	4	94.4 / 0.90		
Iron		11.2	6.5	ug/filter	6/9/2005	8	140 / -21.00	H	*
Lead		3.83	1.2	ug/filter	6/8/2005	4	95.8 / -0.40		

Method Blank   PB 060805 IH - 1174

Test Name	Result Flag	Result	PQL	Units	Analysis Date	%R Flag	RPD Flag
Aluminum	<	5.25	5.25	ug/filter	6/8/2005		
Beryllium	<	0.03	0.03	ug/filter	6/8/2005		
Iron	<	6.50	6.5	ug/filter	6/9/2005		
Lead	<	1.20	1.2	ug/filter	6/8/2005		

*** Preliminary Worksheet Report ***   *Page 7 of 7*

Sample Processing through LIMS
Narrative Reporting in Aspen

Sample Processing through LIMS
Final Reporting in Aspen

Aspen Laboratory Information Management System
Quality Assurance – Non-Trendable QC module

Active Samples

- Login/Edit Samples
- Enter Prep/Sample Information
- Import Data
- Review QC
- Review Status
- Routine Reports
- Print Reports

Worksheet QC

QC Lab#	QC Code	QC Test	Worksheet #	Analysis Date	QC Test Group ID	%R	%R Flag	RPD Flag	QC Calc. Result	QC True/Added:
00.39892-G8 LCS	LCS	Be	WS004355	10/8/2004	00.39892	69.3	L		6.93231354	10
Mark QC Non-Trendable	*Testing comments*									
00.39892-G8 LCS	LCS	Fe							1.69684077	25
Mark QC Non-Trendable										
Media Blank									0.013633378	0
Mark QC Non-Trendable										
Media Blank	BM	Fe							.985127497	0
Mark QC Non-Trendable										
				Y2004		86.9			3.47453791	4
				Y2004		94.3			7.545495081	8

NEW!

mtw:frmAddQCComments : Form

WS004355

Be   00.39892-G8 LCS

Non-trendable process testing. 8/4/05 MTW

[Accept QC Comments]   [Cancel]

Record: ◀◀ ◀ 1 ▶ ▶▶ ▶＊ of 1

[Print] [Back] [Close]

Non-Trendable QC Values

Batch_Number	04092701
WS#	WS004355
Lab#	00.39892-G8 LCS
TestGroupID	00.39892
TestName	Beryllium
NumericResult	0.693231354
AnalysisDate	10/8/2004
Comments	Non-trendable process testing. 8/4/05 MTW

Aspen Laboratory Information Management System
Quality Assurance – Sample Status

Review QC

Review Status

Sample Status

Lab#	Sample ID	Client ID	Program Code	Sample Complete Date	Ready To Report	Report Date	Ready To Archive	Due Date	LIMS#
05062701-001	200501391 A	RJH	KT1170000009	6/28/2005	☑	6/28/2005	☑	6/28/2005	47687
05062701-002	200501391 B	RJH	KT1170000009	6/28/2005	☑	6/28/2005	☑	6/28/2005	47688
05062701-003	200501391 C	RJH	KT1170000009	6/28/2005	☑	6/28/2005	☑	6/28/2005	47689
05062701-004	200501391 D	RJH	KT1170000009	6/28/2005	☑	6/28/2005	☑	6/28/2005	47690
05062701-005	200501391 E	RJH	KT1170000009	6/28/2005	☑	6/28/2005	☑	6/28/2005	47691
05062701-006	200501391 F	RJH	KT1170000009	6/28/2005	☑	6/28/2005	☑	6/28/2005	47692
05062701-007	200501391 G	RJH	KT1170000009	6/28/2005	☑	6/28/2005	☑	6/28/2005	47693
05062701-008	200501391 H	RJH	KT1170000009	6/28/2005	☑	6/28/2005	☑	6/28/2005	47694
05062701-009	200501391 I	RJH	KT1170000009	6/28/2005	☑	6/28/2005	☑	6/28/2005	47695
05062701-010	200501391 J	RJH	KT1170000009	6/28/2005	☑	6/28/2005	☑	6/28/2005	
05062701-011	200501391 K	RJH	KT1170000009	6/28/2005	☑	6/28/2005	☑	6/28/2005	
05062701-012	200501391 L	RJH	KT1170000009	6/28/2005	☑	6/28/2005	☑	6/28/2005	
05062701-013	200501391 M	RJH	KT1170000009	6/28/2005	☑	6/28/2005	☑	6/28/2005	
05062701-014	200501391 N	RJH	KT1170000009	6/28/2005	☑	6/28/2005	☑	6/28/2005	
05062701-015	200501391 O	RJH	KT1170000009	6/28/2005	☑	6/28/2005	☑	6/28/2005	
05062701-016	200501391 P	RJH	KT1170000009	6/28/2005	☑	6/28/2005	☑	6/28/2005	
05062701-017	200501391 Q	RJH	KT1170000009	6/28/2005	☑	6/28/2005	☑	6/28/2005	
05062701-018	200501391 R	RJH	KT1170000009	6/28/2005	☑	6/28/2005	☑	6/28/2005	
05062701-019	200501391 S	RJH	KT1170000009	6/28/2005	☑	6/28/2005	☑	6/28/2005	
05062701-020	200501391 T	RJH	KT1170000009	6/28/2005	☑	6/28/2005	☑	6/28/2005	

Sample Detail | Results | Export | User Ext. | Print | Back | Close | Print SDG Labels

IH Sample Load

Samples Analyzed Between 6/1/05 and 9/30/05

Aspen Laboratory Information Management System
Utilities Menu

Aspen Laboratory Information Management System
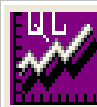## Database Customizations

Active Samples

Login/Edit Samples
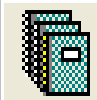
Enter Prep/Sample Information

Import Data

Review QC

Review Status

Routine Reports

Print Reports

Amended Login Report

Prep Batch Creation and Modification; Dilution Flagging; Autosampler Report

QC Template Assignment; Digestion Dilution Transfer

Non-Trendable Module; Auto-import of QC data

Data Package Tracking

IH Sample Load Report

Online Narrative; Merged Anomaly Narrative

What's in the works?

➤ **Run-time analysis flagging program to interface with Perkin-Elmer instruments**

➤ **MiniTab Trending software implementation:**

    ▪ **Automatic QC Trending Charts available for each data packet**

    ▪ **QC Trending Charts for each month updated automatically**

➤ **Interfacing LIMS with various Radiological Instrumentation**

➤ **Sharepoint Interface**

    ▪ **Sample login to Aspen initiated by HSR Industrial Hygienists**

    ▪ **Interface directly with Customer databases**

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